

***Amendments to the Claims***

The listing of claims will replace all prior versions, and listings of claims in the application.

1. (Currently amended) A method for receiving an optical data signal, comprising:
  - (1) receiving an optical data signal;
  - (2) converting the optical data signal to an electrical signal having a symbol rate;
  - (3) generating N sampling signals having a first frequency that is lower than the symbol rate, the N sampling signals shifted in phase relative to one another, wherein N is an integer greater than one;
  - (4) controlling N analog-to-digital converter ("ADC") paths with the N sampling signals to sample the electrical signal at the phases, so as to produce samples;
  - (5) performing at least one or more M-path parallel digital process processes on the samples, wherein  $M=kN$  and k is one of an integer greater than one and or a number in the form of  $1/s$ , where s is an integer greater than one; and
  - (6) generating a digital signal representation of the optical data signal from the samples.
2. (Currently amended) The method according to claim 1, wherein step (5) further comprises performing an equalization process on the samples.

3. (Previously amended) The method according to claim 2, wherein step (5) further comprises performing a Viterbi equalization process on the samples.
4. (Previously amended) The method according to claim 2, wherein step (5) further comprises performing a feed-forward equalization process on the samples.
5. (Previously amended) The method according to claim 2, wherein step (5) further comprises performing a decision feedback equalization process on the samples.
6. (Previously amended) The method according to claim 2, wherein step (5) further comprises performing Viterbi equalization and feed-forward equalization processes on the samples.
7. (Previously amended) The method according to claim 2, wherein step (5) further comprises performing Viterbi equalization and decision feedback equalization processes on the samples.
8. (Currently amended) The method according to claim 2, wherein step (5) further comprises:  
performing one or more of the following types of equalization processes on the samples:  
Viterbi equalization;  
feed-forward equalization; and  
decision feedback equalization.

9. (Currently amended) An optical receiver, comprising:
- a receiver input;
  - an optical-to-electrical converter coupled to the receiver input;
  - an analog-to-digital converter ("ADC") array of N ADC paths, wherein N is an integer greater than 1, each ADC path including an ADC path input coupled to an output of the optical-to-electrical converter; and
  - an M-path digital signal processor coupled to the ADC array, wherein  $M=kN$  and k is one of an integer greater than one and ~~or a number in the form of~~  $1/s$ , where s is an integer greater than one.
10. (Previously amended) The optical receiver according to claim 9, wherein the digital signal processor includes an equalizer.
11. (Previously amended) The optical receiver according to claim 10, wherein the equalizer comprises a Viterbi equalizer.
12. (Previously amended) The optical receiver according to claim 10, wherein the equalizer comprises a feed-forward equalizer.
13. (Previously amended) The optical receiver according to claim 10, wherein the equalizer comprises a decision feedback equalizer.

14. (Previously amended) The optical receiver according to claim 10, wherein the equalizer comprises a Viterbi equalizer and a feed-forward equalizer.

15. (Previously amended) The optical receiver according to claim 10, wherein the equalizer comprises a Viterbi equalizer and a decision feedback equalizer.

16. (Previously amended) The optical receiver according to claim 10, wherein the equalizer comprises a feed-forward equalizer and a decision feedback equalizer.

17. (Previously amended) The optical receiver according to claim 10 wherein the equalizer comprises one or more of:

- a Viterbi equalizer;
- a feed-forward equalizer; and
- a decision feedback equalizer.

18. (Currently amended) An optical receiver, comprising:

means for receiving an optical data signal;

means for converting the optical data signal to an electrical signal having a symbol rate;

means for generating N sampling signals having a first frequency that is lower than the symbol rate, the N sampling signals shifted in phase relative to one another;

means for controlling N analog-to-digital converter ("ADC") paths with the N sampling signals to sample the electrical signal at the phases to produce samples;

means for performing at least one ~~or more~~ M-path parallel digital process ~~processes~~ on the samples, wherein  $M=kN[[],]$  and k is one of an integer greater than one ~~and or a number in the form of 1/s~~, where s is an integer greater than one; and

means for generating a digital signal representation of the optical data signal from the samples.

19. (Previously amended) The system according to claim 18, wherein the means for performing digital processes on the samples include means for equalizing the samples.

20. (Previously amended) The system according to claim 19, wherein the means for equalizing the samples comprise means for performing a Viterbi equalization process on the samples.

21. (Previously amended) The system according to claim 19, wherein the means for equalizing the samples comprise means for performing a feed-forward equalization process on the samples.

22. (Previously amended) The system according to claim 19, wherein the means for equalizing the samples comprise means for performing a decision feedback equalization process on the samples.

23. (Previously amended) The system according to claim 19, wherein the means for equalizing the samples comprise means for performing Viterbi equalization and feed-forward equalization processes on the samples.

24. (Previously amended) The system according to claim 19, wherein the means for equalizing the samples comprises means for performing Viterbi equalization and decision feedback equalization processes on the samples.

25. (Previously amended) The method according to claim 2, wherein step (1) comprises receiving the optical data signal from a multimode optical fiber and step (5) comprises equalizing multimode dispersion from the multimode optical fiber.

26. (Previously amended) The method according to claim 2, wherein step (1) comprises receiving the optical data signal from a single mode optical fiber and step (5) comprises equalizing chromatic and/or waveguide dispersion from the single mode optical fiber.

27. (Previously amended) The method according to claim 2, wherein step (1) comprises receiving the optical data signal from a multimode optical fiber and step (5) comprises equalizing chromatic and/or waveguide dispersion from the multimode optical fiber.

28. (Previously amended) The method according to claim 2, wherein step (1) comprises receiving the optical data signal from a single mode optical fiber and step (5) comprises equalizing polarization mode dispersion from the single mode optical fiber.

29. (Previously amended) The method according to claim 2, wherein step (1) comprises receiving the optical data signal from a single mode optical fiber and step (5) comprises equalizing dispersion induced in the single mode optical fiber by laser chirping.

30. (Previously amended) The method according to claim 2, wherein step (1) comprises receiving the optical data signal from a transmitter that lacks external modulators, and step (5) comprises equalizing excess dispersion induced by laser chirping.

31. (Previously amended) The optical receiver according to claim 10, wherein the input is coupled to a multimode optical fiber and the equalizer equalizes multimode dispersion from the multimode optical fiber.

32. (Previously amended) The optical receiver according to claim 10, wherein the input is coupled to a single mode optical fiber and the equalizer equalizes chromatic and/or waveguide dispersion from the single mode optical fiber.

33. (Previously amended) The optical receiver according to claim 10, wherein the input is coupled to a multimode optical fiber and the equalizer equalizes chromatic and/or waveguide dispersion in the multimode optical fiber.

34. (Previously amended) The optical receiver according to claim 10, wherein the input is coupled to a multimode optical fiber and the equalizer equalizes polarization mode dispersion from the single mode optical fiber.

35. (Previously amended) The optical receiver according to claim 10, wherein the input is coupled to a single mode optical fiber and the equalizer equalizes dispersion induced in the single mode optical fiber by laser chirping.

36. (Previously amended) The optical receiver according to claim 10, wherein the input receives the optical data signal from a transmitter that lacks external modulators, and the equalizer equalizes excess dispersion induced by laser chirping.

37. (Previously amended) The optical receiver according to claim 19, wherein the means for receiving an optical signal is coupled to a multimode optical fiber and the means for equalizing comprises means for equalizing multimode dispersion from the multimode optical fiber.

38. (Previously amended) The optical receiver according to claim 19, wherein the means for receiving an optical signal is coupled to a single mode optical fiber and the



means for equalizing comprises means for equalizing chromatic and/or waveguide dispersion from the single mode optical fiber.

39. (Previously amended) The optical receiver according to claim 19, wherein the means for receiving an optical signal is coupled to a multimode optical fiber and the means for equalizing comprises means for equalizing chromatic and/or waveguide dispersion in the multimode optical fiber.

40. (Previously amended) The optical receiver according to claim 19, wherein the means for receiving an optical signal is coupled to a multimode optical fiber and the means for equalizing comprises means for equalizing polarization mode dispersion from the single mode optical fiber.

41. (Previously amended) The optical receiver according to claim 19, wherein the means for receiving an optical signal is coupled to a single mode optical fiber and the means for equalizing comprises means for equalizing dispersion induced in the single mode optical fiber by laser chirping.

42. (Previously amended) The optical receiver according to claim 19, wherein the means for receiving an optical signal receives the optical data signal from a transmitter that lacks external modulators, and the means for equalizing comprises means for equalizing excess dispersion induced by laser chirping.

43. (Previously amended) The method according to claim 1, wherein step (5) comprises decoding a convolutional code.

44. (Previously amended) The method according to claim 1, wherein step (5) comprises decoding a trellis code.

45. (Previously amended) The method according to claim 1, wherein step (5) comprises decoding a block code.

46. (Previously amended) The optical receiver according to claim 9, wherein the digital signal processor comprises a convolutional decoder.

47. (Previously amended) The optical receiver according to claim 9, wherein the digital signal processor comprises a trellis decoder.

48. (Previously amended) The optical receiver according to claim 9, wherein the digital signal processor comprises a block decoder.

49. (Previously amended) The optical receiver according to claim 18, wherein the means for performing digital processes on the samples comprises means for decoding a convolutional code.

50. (Previously amended) The optical receiver according to claim 18, wherein the means for performing digital processes on the samples comprises means for decoding a trellis code.

51. (Previously amended) The optical receiver according to claim 18, wherein the means for digitally performing digital processes on the samples comprises means for decoding a block code.